2009 Compound Hunting Bow Evaluation

Mathews Reezen 6.5 Test Results

By *Anthony Barnum*

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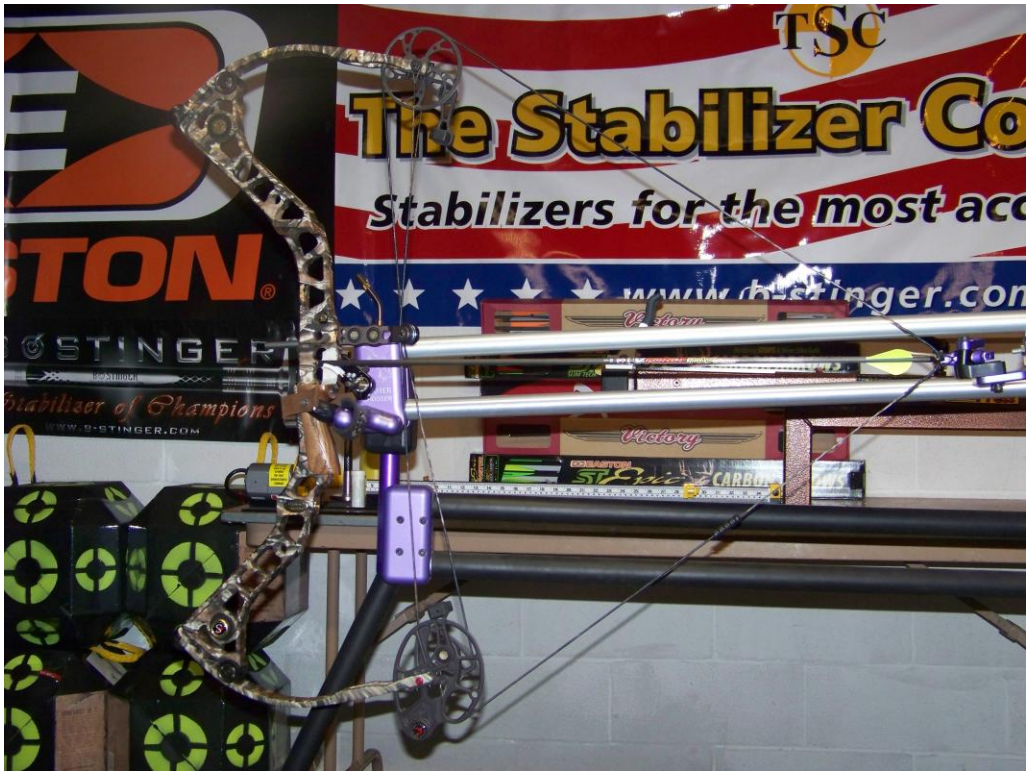

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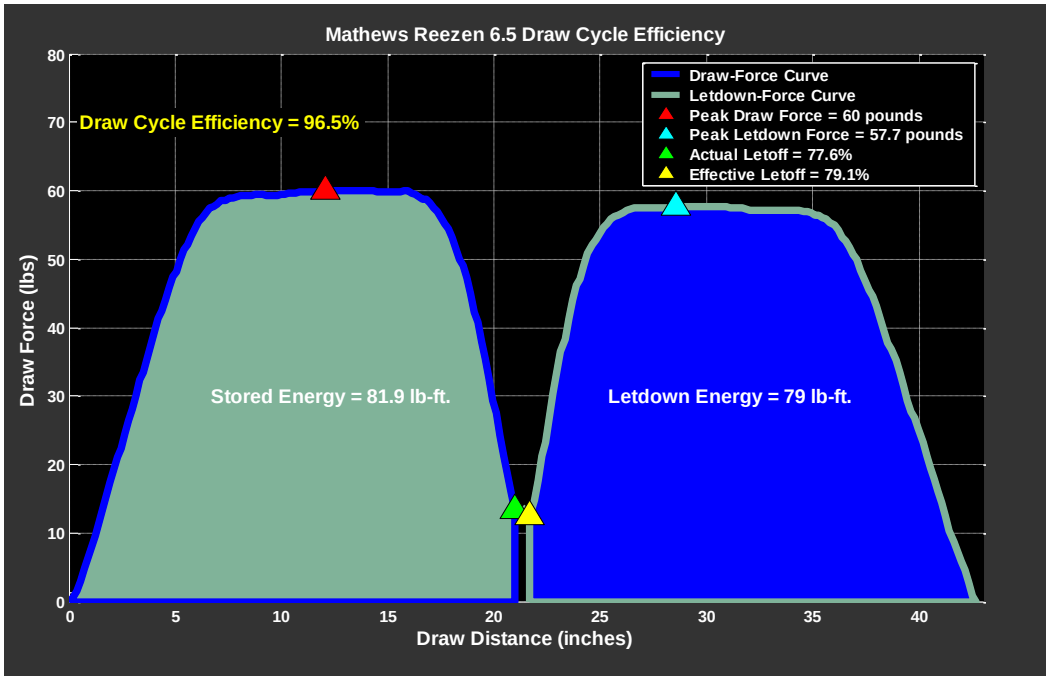
Mathews Reezen 6.5



Introduction:

As one of the perennial powerhouses in the archery industry, expectations are usually set very high for the offerings from Mathews. Mathews' flagship model for 2009, the Reezen 6.5, offers some innovative features that are sure to benefit both the consumer and shop-owner alike. First, the Reezen 6.5 offers advertised speeds of up to 340 fps which is a real benefit for those archers who want fast speeds while maintaining the ease of use found in a single cam system. In fact, the Reezen 6.5 is dubbed as the fastest single-cam bow that Mathews has ever tested. The Reezen 6.5 utilizes new Reezen solo-cam system that, when paired with SE^4 composite slim limbs, results in a substantial amount of stored energy. This new cam system is draw-length specific meaning that a new eccentric is required to adjust draw-length. To help address the amount of time associated with changing out the eccentric, Mathews has developed the Quick Change Axle to replace the standard axle / e-clip combination, which is a benefit for the shop owner. The use of String Grubs and the Harmonic Stabilizer helps to minimize felt vibration and noise, and rounds out the new additions to the bow. The vibration and noise output ratings are quite good for the Reezen 6.5, especially considering the amount of speed it produces.

Mathews Reezen 6.5

Contact Info: **Mathews Inc.**
www.mathewsinc.com

MSRP:	$869	**Draw Length:**	24"-30" *
Cams:	Reezen Cam	**Draw Weight:**	40-70*
Limbs:	SE^4 Composite Slim Limb	**Brace Height:**	6 ½" *
Grip:	In-Line Grip™	**Axle to Axle:**	32"*
Let-off:	80%*	**Mass Weight:**	4.15*
String:	Zebra Bowstring & Cable		
Damping:	Harmonic Damper / Stabilizer, String Grub		*Advertised
Finish:	Mathews Lost Camo		^Measured

Performance at a Glance (60.0 lbs, 29 ¼"):

Arrow	Speed	K.E.	Momentum
300 Grains	317.1	67.0	13.6
360 Grains	293.5	68.9	15.1
420 Grains	275.7	70.9	16.5
540 Grains	245.4	72.2	18.9

Arrow (Grains):	300	360	420	540
Dynamic Efficiency:	81.8%	84.1%	86.5%	88.2%
Speed Per Inch of PS:	15.1	14.0	13.1	11.7
Noise Output (dBA):	89.7	88.7	84.7	89.0
Total Vibration (G):	295.0	191.7	183.1	131.2

The Reezen sample that was provided to Archery Evolution was measured to have a brace-height of 6.500 inches, while the axle-to-axle length was measured to be 32 inches. The requested 29 inch, 60 pound model was measured straight out of the box to have a 29 ¼ inch draw length and peak draw-weight of 61.8 pounds. At these settings, the Reezen 6.5 achieved an average speed of 324.8 fps when shot by hand in the out of box configuration with a 300 grain arrow. When shot from the shooting machine with the addition of a string loop, the Reezen 6.5 achieved an average speed of 321.5 fps at these settings. Per request from Mathews, a slight adjustment to the limb bolts was made to bring the Reezen 6.5 down to the exact draw-weight specification of 60.0 pounds.

A thorough examination of the finish quality showed minimal imperfections. There was a small raised area in the Lost Camo finish just below the rear stabilizer bushing and small "pin-prick" areas void of film-dip in the cut-out area near the top of the bow. Otherwise, the riser has nice lines and the extensive cutouts are both aesthetically pleasing and help to reduce overall mass weight of the bow. The machining and anodizing on the roller-guard, sphere-lock limb pockets, limb turrets and cam system was impeccable, while the SE^4 composite slim limbs had smooth, rounded edges with no visible blemishes. There were no noticeable imperfections found on the wooden In-Line Grip™ that, while a bit larger than I prefer, had nice contours that fit smoothly in the hand. All in all the fit, finish, look and feel of the Reezen 6.5 is quite good.

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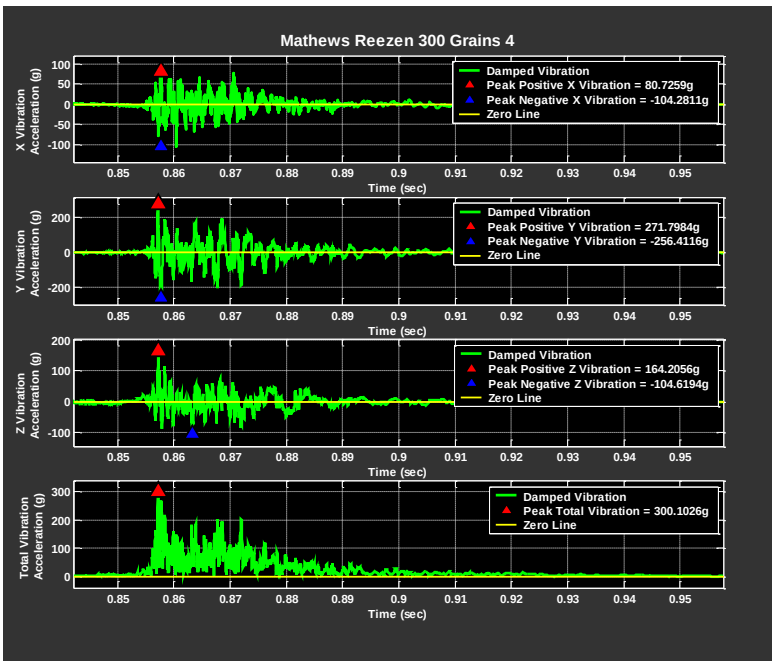
Detailed Test Results:

Speed / Performance Measurements:

Speed measurements were made with 4 different arrow weights to determine the average speed of the bow per inch of Power Stroke. Utilizing the stored energy obtained from the Force-Draw curve, average dynamic efficiency was calculated.

Speed per inch of Power Stroke: 13.5
Dynamic Efficiency: 85.1%

Speed Point Blank - 29" ± 1/4", 60# ± 1#	Mathews Reezen 6.5							
	Brace Height = 6.500		Draw Weight = 60.0		Draw Length = 29 1/4		Axle-to-Axle = 32	
Grains	300 Grains		360 Grains		420 Grains		540 Grains	
Chronograph	BFM	Pro-Chrono	BFM	Pro-Chrono	BFM	Pro-Chrono	BFM	Pro-Chrono
1	~~317.4~~	316	293.5	293	275.7	275	~~245.6~~	245
2	317.0	316	~~293.2~~	293	275.7	275	245.4	245
3	317.0	316	293.5	293	~~275.8~~	275	245.5	245
4	317.2	316	~~293.7~~	293	~~275.6~~	275	245.4	245
5	~~316.9~~	316	293.6	293	275.7	275	~~245.3~~	245
Avg. Speed	317.1	316	293.5	293	275.7	275	245.4	245
Kinetic Energy	67.0	66.5	68.9	68.6	70.9	70.5	72.2	72.0
Momentum	13.6	13.5	15.1	15.1	16.5	16.5	18.9	18.9
Power Stroke	21.000							
Speed per inch of Power Stroke	15.1	15.0	14.0	14.0	13.1	13.1	11.7	11.7
Avg. Speed per inch of PS	13.5							
Stored Energy	81.9							
Dynamic Efficiency	81.8%	81.2%	84.1%	83.8%	86.5%	86.1%	88.2%	87.9%
Avg. Dynamic Efficiency (BFM)	85.1%							



Vibration Measurements:

Vibration measurements were made with 4 different arrow weights to determine the average vibration in 3 dimensions as well as the total average vibration.

Positive X-Vibration: 69.3 g
Negative X-Vibration: -70.6 g

Positive Y-Vibration: 176.8 g
Negative Y-Vibration: -179.5 g

Positive Z-Vibration: 96.9 g
Negative Z-Vibration: -74.6 g

Total Vibration: 200.3 g

Sound Measurements:

Sound measurements were made with 4 different arrow weights to determine the average sound output, the average A-Weighted sound output (mimicking the human ear) and the average C-Weighted sound output.

Unweighted Sound Output: 104.1 dB
A-Weighted Sound Output: 88.0 dBA
C-Weighted Sound Output: 95.4 dBC

The addition of the 12 inch B-Stinger Pro Stabilizer with a 14 ounce weight yielded a reduction of peak A-weighted sound Output when measured with a 360 grain arrow.

B-Stinger Reduction: 0.6%

Noise & Vibration	Mathews Reezen 6.5											
	Brace Height = 6.500				Draw Weight = 60.0				Draw Length = 29 1/4			Axle to Axle = 32
Parameter	Peak Noise Output (dB)				Peak A-Weighted Noise Output (dBA)				Peak C-Weighted Noise Output (dBC)			
Grains	300 Grains	360 Grains	420 Grains	540 Grains	300 Grains	360 Grains	420 Grains	540 Grains	300 Grains	360 Grains	420 Grains	540 Grains
Measurement	Max				Max				Max			
1	~~106.2~~	~~106.0~~	~~100.9~~	~~105.7~~	~~90.7~~	90.1	~~84.1~~	~~90.6~~	98.2	~~97.2~~	91.5	~~96.6~~
2	106.4	103.9	103.7	~~104.3~~	~~88.3~~	88.2	~~87.9~~	~~87.9~~	~~97.2~~	94.9	94.7	~~95.6~~
3	106.4	~~101.0~~	101.4	105.4	89.8	~~84.3~~	84.7	89.9	~~98.3~~	~~91.8~~	~~91.4~~	96.4
4	~~106.8~~	102.2	~~103.9~~	104.7	89.9	~~90.8~~	85.3	88.0	98.2	93.6	~~95.7~~	96.4
5	106.7	101.9	102.2	104.3	89.4	87.8	84.1	89.0	97.8	93.2	94.0	96.1
Average	106.5	102.7	102.4	104.8	89.7	88.7	84.7	89.0	98.1	93.9	93.4	96.3
Total Average Max	104.1				88.0				95.4			

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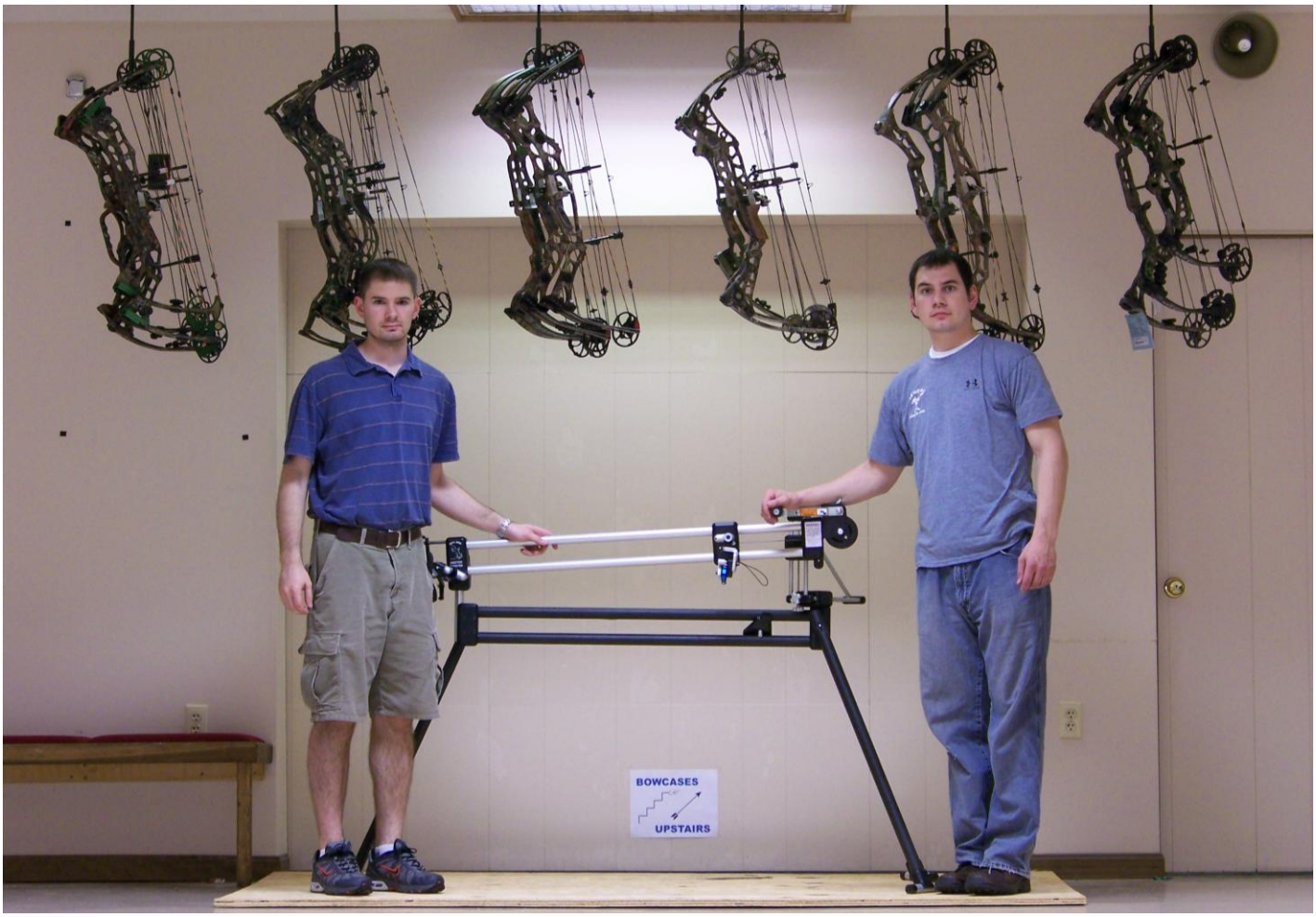

Anthony Barnum

Jonathan Teater

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